Verónica G. Melesse Vergara (Larrea)

Curriculum Vitae

Education

2009–2011 **M. S. in Computational Science**, *Florida State University*, Tallahassee, FL.

2005–2008 **B. A. in Mathematics/Physics**, *Reed College*, Portland, OR.

Masters Thesis

Title *Construction of Delaunay Triangulations on the Sphere: A parallel approach*

Supervisor Dr. Max Gunzburger

Experience

Technical

2020–Present **Group Leader User Support Pre-production Systems**, Oak Ridge National Laboratory, Oak Ridge, TN.

Ensure functionality, stability, and performance of new NCCS systems which includes activities such as test development, acceptance, software installation, documentation, and early user support for pre-production systems.

2014–Present **HPC Engineer**, Oak Ridge National Laboratory, Oak Ridge, TN.

Provide scientists and researchers with training, documentation, and day-to-day assistance to enable their successful use of the high-performance computing (HPC) resources. Duties include compiling, installing, and debugging scientific applications at-scale.

Leadership experience:

- **OLCF System Test Lead**: Coordinate and execute large-scale testing to verify new software and identify potential defects on Summit, currently the second fastest supercomputer in the world.
- **Acceptance Test Project Lead**: Lead the design and implementation of the acceptance test plan for ORNL's next-generation supercomputers and partner programs's systems as listed below. Coordinate the selection and development of test cases to ensure the functionality, performance, and stability of the target system.
  - OLCF-4 project: Summitdev system and Summit supercomputer.
  - NCRC program: C3 and C4 supercomputers.
  - Air Force Weather program: production systems.
  - OLCF-5 project: ORNL's first exascale supercomputer, Frontier.

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2017–Present **ACM SIGHPC Meetings Coordinator**, ACM Special Interest Group on High Performance Computing Executive Committee.
Manage the submission process for in-cooperation proposals received from HPC events.

2011–2014 **Scientific Applications Analyst**, Purdue University, West Lafayette, IN.
Diagnosed and troubleshot application, data, and computing problems. Provided advanced user support to researchers utilizing Purdue's computing resources. Designed, implemented, tested, debugged, and documented examples and benchmarks for scientific software. Implemented a notification system for Environment Modules to announce changes. Developed a license usage monitoring application to track the commercial software utilization.

Leadership experience:

- **Workshop coordinator:** Coordinated workshops and led training activities to introduce users to HPC.
- **XSEDE Resource Allocation Council representative:** Served as main support staff for Extreme Science and Engineering Discovery Environment (XSEDE) systems at Purdue.

2010–2011 **Research Assistant**, Florida State University, Tallahassee, FL.
Designed and implemented a parallel algorithm for the construction of Delaunay triangulations on the sphere (SDTs) under the supervision of Dr. Max Gunzburger. Code was written in C++ using MPI.

2009-2010 **Graduate Research Assistant**, Florida State University, Tallahassee, FL.
Provided technical support and worked on several projects to support users of the university's HPC center.

Project highlights:

- Designed and implemented web applications using PHP, JavaScript and MySQL to manage the users database.
- Developed Perl and Python scripts to search the LDAP directory and consolidate records in the internal database.
- Worked under the supervision of Dr. Paul van der Mark and Dr. Brian Arbic to improve the self-attraction and loading implementation in numerical ocean tide models.

Diversity and Inclusion

2019–Present **Pathways to Computing Internship Program Director**, Oak Ridge National Laboratory, Oak Ridge, TN.
Oversee the student selection and mentor matching process for the internship program. Manage a yearly budget of $100K to support 10 undergraduate interns from underrepresented groups.

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2015–2019 **CREU Program Co-Director**, CRA-W Collaborative Research Experience for Undergraduates.
Collaborate with other CREU directors to manage a year long internship program for undergraduate students from underrepresented groups.

Honors and Awards

2019 **U.S. Department of Energy Secretary Achievement Award**
- Summit and Sierra teams

UT-Battelle Annual Awards Night Mission Support Award
- Summit Acceptance Team

ORNL Significant Event Award
- Acceptance Testing of the Summit Supercomputer

CUG 2019 Best Paper Finalist
- Vergara Larrea, V. G., Budiardja, R., et al., *Experiences porting mini-applications to OpenACC and OpenMP on heterogeneous systems*.

2016 **NCCS Employee of the Quarter for FY16 Q3**

2015 **CUG 2015 Best Paper Award**
- Vergara Larrea, V. G., Joubert, W., and Fuson, C., *Use of Continuous Integration Tools for Application Performance Monitoring*.

CUG 2015 Best Paper Finalist
- Vergara Larrea, V. G., Oral S., et al., *A More Realistic Way of Stressing the End-to-end I/O System*.

2013 **ATPESC 2013 Scholar**
- *Inaugural Argonne Training Program on Extreme-Scale Computing*

2012 **SC12 Broader Engagement SURA/XSEDE Fellow**
- *SC12: International Conference for High Performance Computing, Networking, Storage and Analysis*

2011 **Phi Kappa Phi Member**
- *Honor Society of Phi Kappa Phi Induction Ceremony*

2010 **SC10 Student Volunteer**
- *SC10: International Conference for High Performance Computing, Networking, Storage and Analysis*

2009 **Latin American Scholarship**
- *Florida State University*

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2007 **A. A. Knowlton Scholarship**
- *Reed College*

2007–2008 **Commendation of Excellence for Academic Performance**
- *Reed College*

Technical Skills

Programming Languages: C/C++, Python, Perl, Fortran 90, Java.

Parallel Programming: MPI, OpenMP, OpenACC, CUDA.

Schedulers and Resource Managers: PBSPro, Torque, Moab, HTCondor, LSF, Slurm.

Web Development: PHP, JavaScript, MySQL, HTML.

Publications

1. **Vergara Larrea, V. G.**, Budiardja, R. D., Gayatri, R., Daley, C., Hernandez, O., Joubert, W., *Experiences in porting mini-applications to OpenACC and OpenMP on heterogeneous systems*. Concurrency and Computation: Practice and Experience, e5780., 2020.

2. Oral, S., Vazhkudai, S., Wang, F., et. al., *End-to-end I/O portfolio for the Summit supercomputing ecosystem*. Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'19), Denver, CO, November 2019.

3. Kuchta, C., Budiardja, R., **Vergara Larrea, V. G.**, *Harmony: A Harness Monitoring System for the Oak Ridge Leadership Computing Facility*. Proceedings of the Practice Experience in Advanced Research Computing 2019 Conference (PEARC 2019), Chicago, IL, July 2019.

4. **Vergara Larrea, V. G. et al.**, *Scaling the Summit: Deploying the World's Fastest Supercomputer*. High Performance Computing. ISC High Performance 2019. Lecture Notes in Computer Science (LNCS), vol 11887. Springer, Cham, 2019.

5. **Vergara Larrea, V. G.**, Joubert W., Brim, M. J., et al. *Scaling the Summit: Deploying the World's Fastest Supercomputer*. Proceedings of the International Workshop on OpenPOWER for HPC (IWOPH'19) co-located with ISC High Performance 2019. Frankfurt, Germany, June 2019.

6. Pophale S., Boehm S., **Vergara Larrea, V. G.** *Comparing High Performance Computing Accelerator Programming Models*. High Performance Computing. ISC High Performance 2019. Lecture Notes in Computer Science, vol 11887. Springer, Cham, 2019.

7. Pophale S., Boehm S., **Vergara Larrea, V. G.**, *Comparing High Performance Computing Accelerator Programming Models*, Proceedings of the 4th International Workshop on Performance Portable Programming Models for Accelerators (P^3MA 2019) co-located with ISC High Performance 2019, Frankfurt, Germany, June 2019.

8. **Vergara Larrea, V. G.**, Brim, M. J., Joubert, W., Boehm, S., Baker, M., Hernandez, O., Maxwell, D., *Are we witnessing the spectre of an HPC meltdown?*. Concurrency and Computation: Practice and Experience, 31(16), e5020., 2019.

9. Lopez, M. G., Joubert, W., **Vergara Larrea, V. G.**, Hernandez, O., et al., *Evaluation of Directive-based Performance Portable Programming Models*, Special Edition of the International Journal of High Performance Computing and Networking,14(2), 165-182., 2019

10. Boehm S., Pophale S., **Vergara Larrea, V. G.**, Hernandez O., *Evaluating Performance Portability of Accelerator Programming Models using SPEC ACCEL 1.2 Benchmarks*. In: Yokota R., Weiland M., Shalf J., Alam S. (eds) High Performance Computing. ISC High Performance 2018. Lecture Notes in Computer Science, vol 11203. Springer, Cham, 2018.

11. Boehm S., Pophale S., **Vergara Larrea, V. G.**, Hernandez O., *Evaluating Performance Portability of Accelerator Programming Models using SPEC ACCEL 1.2 Benchmarks*, Proceedings of the 3rd International Workshop on Performance Portable Programming Models for Accelerators (P^3MA 2018), Frankfurt, Germany, June 2018.

12. **Vergara Larrea, V. G.**, et al., *Are We Witnessing the Spectre of an HPC Meltdown?*, Cray User Group 2018 Conference Proceedings, Stockholm, Sweden, May 2018.

13. **Vergara Larrea, V.G.** et al. *Experiences Evaluating Functionality and Performance of IBM POWER8+ Systems*. In: Kunkel J., Yokota R., Taufer M., Shalf J. (eds) High Performance Computing. ISC High Performance 2017. Lecture Notes in Computer Science, vol 10524. Springer, Cham, 2017.

14. **Vergara Larrea, V.G.** et al. *Experiences Evaluating Functionality and Performance of IBM POWER8+ Systems*. Proceedings of the International Workshop on OpenPOWER for HPC (IWOPH'17), Frankfurt, Germany, June 2017.

15. **Vergara Larrea, V. G.**, Hernandez, O., et al., *An in-depth evaluation of GCC's OpenACC implementation on Cray systems*, Cray User Group 2017 Conference Proceedings, May 2017.

16. Lopez, M. G., **Vergara Larrea, V. G.**, Joubert, W., Hernandez, O., Haidar, A., Tomov, S., Dongarra, J., *Towards Achieving Performance Portability Using Directives for Accelerators*, Proceedings of the Third International Workshop on Accelerator Programming Using Directives, November 2016.

17. **Vergara Larrea, V. G.**, Joubert, W., Lopez, M. G., and Hernandez, O., *Early experiences writing performance portable OpenMP 4 codes*, Cray User Group 2016 Conference Proceedings, May 2016.

18. Wang, F., **Vergara Larrea, V. G.**, Leverman, D., Oral, S., *FCP: A Fast and Scalable Data Copy Tool for High Performance Parallel File Systems*, Cray User Group 2016 Conference Proceedings, May 2016.

19. Zimmer, C., Gupta, S., **Vergara Larrea, V. G.**, *Finally, A Way to Measure Frontend I/O Performance*, Cray User Group 2016 Conference Proceedings, May 2016.

20. Oral, S., Zimmer, C., and **Vergara Larrea, V. G.**, *Darshan Evaluation at the Oak Ridge Leadership Computing Facility*, ORNL Technical Report, April 2016.

21. Juckeland, G., Hernandez, O., Jacob, A., Neilson, D., **Vergara Larrea, V. G.**, Wienke, S. and Bobyr, A., Brantley, W., Chandrasekaran, S., Colgrove, M., et al., *From Describing to Prescribing*

Parallelism: Translating the SPEC ACCEL OpenACC Suite to OpenMP Target Directives, First International Workshop on Performance Portable Programming Models for Accelerators, January 2016.

22. Harrell, S. L., Nam, H., **Vergara Larrea, V. G.**, Keville, K. and Kamalic, D., *Student Cluster Competition: A multi-disciplinary undergraduate HPC educational tool*, Proceedings of the Workshop on Education for High-Performance Computing, November 2015.

23. **Vergara Larrea, V. G.**, Joubert, W., and Fuson, C., *Use of Continuous Integration Tools for Application Performance Monitoring*, Cray User Group 2015 Conference Proceedings, April 2015.

24. **Vergara Larrea, V. G.**, Oral S., Leverman, D. B., Nam, H. A., Wang, F., and Simmons, J., *A More Realistic Way of Stressing the End-to-end I/O System*, Cray User Group 2015 Conference Proceedings, April 2015.

Posters and Presentations

1. **Vergara Larrea, V. G.**, Hadri, B., *HPC System Testing: Procedures, Acceptance, Regression Testing, and Automation*, Birds of a Feather session at the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'19), Denver, CO, November 2019.

2. Barrios Hernández, C. J., Meneses, E., Hernández, B., **Vergara Larrea, V. G.**, *HPC Americas Collaboration*, Birds of a Feather session at the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'19), Denver, CO, November 2019.

3. **Vergara Larrea, V. G.**, *On the road to Exascale: Past, Present, and Future leadership-class systems at the OLCF*, Invited talk at the High Performance Computing in Latin America Conference 2019 (CARLA 2019), San José, Costa Rica, September 25, 2019.

4. **Vergara Larrea, V. G.**, *Deploying the World's Fastest Supercomputer: Challenges and Lessons Learned*, Keynote at the HPC Management Workshop at the High Performance Computing in Latin America Conference 2019 (CARLA 2019), San José, Costa Rica, September 24, 2019.

5. **Vergara Larrea, V. G.**, Joubert, W., et al., *Scaling the Summit: Deploying the World's Fastest Supercomputer*. Poster Session, Smoky Mountains Computational Sciences and Engineering Conference. Kingsport, TN. August 28, 2019.

6. Li, J., **Vergara Larrea, V. G.**, *Introduction to the SPEC HPG benchmarks*. Tutorial session in the Practice Experience in Advanced Research Computing 2019 (PEARC 2019) Conference, Chicago, IL, July 2019.

7. Kuchta, C., Budiardja, R., **Vergara Larrea, V. G.**, *Harmony: A Harness Monitoring System for the Oak Ridge Leadership Computing Facility*. Project Poster at the International Supercomputing Conference 2019 (ISC 2019). Frankfurt, Germany. June 17, 2019.

8. **Vergara Larrea, V. G.**, *HPC at the Oak Ridge Leadership Computing Facility: Careers, Research Opportunities, and State-of-the-Art Technology*. Speaker for the CRA-W Virtual Undergraduate Town Hall. February 8, 2018.

9. **Vergara Larrea, V. G.**, and Hernandez, O., *Leveraging the SPEC benchmark suites to measure and compare performance of HPC systems*. General Poster Session, Oak Ridge Leadership Computing Facility User Meeting 2017. Oak Ridge, TN. May 17, 2017.

10. **Vergara Larrea, V. G.**, and Simpson, A. B., *HPC Workshop on GPU Accelerated Computing* (hands-on session). SIAM Conference on Computational Science and Engineering. Atlanta, GA. February 28, 2017.

11. **Vergara Larrea, V. G.**, and Simpson, A. B., *HPC Workshop: Supercomputing in a Nutshell* (hands-on session). SIAM Conference on Computational Science and Engineering. Atlanta, GA. February 27, 2017.

12. **Vergara Larrea, V. G.**, and Simpson, A. B., *GPU Accelerated Computing* (hands-on session). 2016 ACM Richard Tapia Celebration of Diversity in Computing conference. Arlington, VA. September 18, 2016.

13. **Vergara Larrea, V. G.**, and Simpson, A. B., *Supercomputing in a Nutshell* (hands-on session). Computational Science Graduate Fellowship Annual Program Review. Arlington, VA. July 16, 2015.

14. **Vergara Larrea, V. G.**, Joubert, W., and Fuson, C., *Using Jenkins to Monitor Application Performance on Supercomputers*. General Poster Session, Grace Hopper Celebration of Women in Computing Conference. Houston, TX. October 14, 2015.

15. **Vergara Larrea, V. G.**, Joubert, W., and Fuson, C., *Using Jenkins to Monitor Application Performance and Environment Stability on Supercomputers*. Poster Session, Smoky Mountains Computational Sciences and Engineering Conference. Gatlinburg, TN. September 2, 2015.

16. **Vergara Larrea, V. G.**, and Simpson, A. B., *Supercomputing in a Nutshell* (hands-on session). Computational Science Graduate Fellowship Annual Program Review. Arlington, VA. July 29, 2015.

17. Shah, H., Sardeshmukh, S., and **Vergara Larrea, V. G.**, *Optimizing the General Equation Mesh Solver (GEMS) for the Intel Xeon Phi coprocessor*. Special Program Graduate Student Poster Session, XSEDE14 Extreme Science and Engineering Discovery Environment Conference. Atlanta, GA. July 16, 2014.

18. Krishnakumar, L., Sardeshmukh, S., and **Vergara Larrea, V. G.**, *Performance Evaluation of the General Equation and Mesh Solver (GEMS)*. Graduate Student Poster Session, XSEDE14 Extreme Science and Engineering Discovery Environment Conference. Atlanta, GA. July 16, 2014.

Professional Activities

Leadership Role

2020 SC20 Student Cluster Competition Co-Chair

CARLA 2020: LA-WHPC 2020 Workshop Co-Organizer

ORNL Computer and Computational Sciences Directorate - Diversity and Inclusion Committee Chair

2019 SC19 Registration, Store, and Merchandise Chair

2018 SC18 Infrastructure Space Chair

2017 SC17 Infrastructure Space Vice Chair

2016 SC16 Student/Postdoc Job Fair Chair

2015 SC15 Student Programs Coordination Chair

CUG 2015 Session Chair

Invited Speaker

2020 SIAM Workshop Celebrating Diversity Luncheon

2019 CARLA 2019 HPC Track

Computing Management Good Practices Workshop co-located with CARLA 2019

2016 GHC 2016 Student Opportunity Lab

2015 GHC 2015 Student Opportunity Lab

Committee Member

2020 SIAM CSE 2021 Broader Engagement Program

Smoky Mountains Conference 2020 Technical Program

SPEC High Performance Group ORNL Representative

SC20 Technical Program: State of the Practice

CUG 2020 Technical Program

2019 CUG 2019 Technical Program

SIAM CSE 2019 Broader Engagement Program

2018 CUG 2018 Technical Program

2017 CUG 2017 Technical Program

SIAM CSE 2017 Broader Engagement Program

SC17 Students@SC Finance/Arrangements

2016 CUG 2016 Technical Program

2015 SIAM CSE 2015 Broader Engagement Program

2014 SC14 Student Cluster Competition

SC13 Student Cluster Competition

Purdue University XSEDE Resource Allocation Committee – Site Provider Representative

Reviewer

2020 INCITE 2021 Computational Readiness

2020 Tapia Conference Birds of a Feather

2019 INCITE 2020 Computational Readiness

2018 INCITE 2019 Computational Readiness

2017 2017 Tapia Conference Posters

2017 Tapia Conference Birds of a Feather

GHC 2017 Scholarship Application
2016 GHC 2016 Scholarship Application
INCITE 2017 Computational Readiness
2016 Tapia Conference Birds of a Feather
2015 GHC 2015 Scholarship Application
INCITE 2016 Computational Readiness
LAtINiTY Scholarship
2015 Tapia Conference Posters
2014 GHC 2014 Scholarship Application
2013 2014 Tapia Conference Posters

Certifications

2013 Six Sigma Green Belt (Sep. 2013).
2012 ITIL Foundation for IT Service Management (Mar. 2012).

Professional Memberships

2015–Present SPEC High Performance Group Member
2015–Present ACM Professional Membership
2015–Present ACM SIGHPC Membership
2015–Present IEEE Computer Society Membership
2012–Present IEEE Membership

Language Skills

Spanish **Native**
English **Bilingual**
French **Basic**

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